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(54) **LED LAMP AND MANUFACTURE THEREOF**

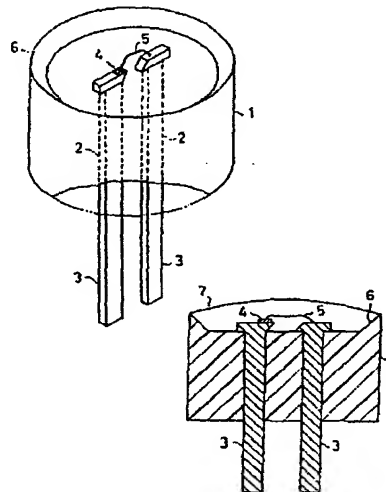
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(57) Abstract:

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PURPOSE: To obtain an LED with low manufacturing cost and high reliability by a method wherein an LED chip is bonded to the top of one of a pair of external leads fitted in cavities provided in a resin package and sealing resin is applied to the light emitting plane of the resin package.

CONSTITUTION: An LED lamp is constituted by a resin package 1, a pair of external leads 3 which are fitted in cavities 2 provided in the resin package 1, an LED chip 4 which is bonded to one of a pair of the external leads 3, a lead wire 5 which is connected between the LED chip 4 and the other external lead 3 and sealing resin 7 applied to the light emitting plane of the resin package 1. The resin package 1 is, for instance, composed of cylindrically injection- molded white polycarbonate resin and a tapered reflective plane 6 is provided on the circumference of its top surface to reflect the light emitted by the LED chip 4 upward. Then the sealing resin 7 composed of double-liquid type transparent epoxy resin is applied to the top surface of this package to protect the LED chip 4 and the lead wire



BESCHEIDSÜBERSETZUNG

Ausstellungsdatum: 17. 09. 2002

Zustellungsdatum: 18. 10. 2002

Die angemeldete Erfindung ist aufgrund folgender Vorveröffentlichung leicht herleitbar und daher gemäß Par. 29, Absatz 2 PG nicht schutzfähig:

Zu den Ansprüchen 1 bis 4:

Entgegenhaltung:

1. Jap. Pat.-Offenlegungsschrift Nr. 62-224986

(In der Entgegenhaltung (vgl. Fig. 2) sind ein Leuchtelement, das auf dem Boden einer lichtundurchlässigen Wanne angeordnet ist, und die Abdichtung in der Wanne mit einem lichtdurchlässigen Harz angegeben.)

Einen Leiterrahmen einer Diode die Bodenfläche einer Wanne entlang anzuordnen, ist in der Beschreibung und Zeichnung gemäß jap. Gbm.-Anmeldung Nr. 2-65760 (= Jap. Gbm.-Offenlegungsschrift Nr. 4-25260) angegeben.

(Citation 1)

JP Patent Appln. Disclosure No. 62-224986 - Oct. 2, 1987

Patent Application No. 61-69555 - March 27, 1986

Priority: none

Applicant: Toyota Gosei K.K., Aichi Prefecture, Japan

Title: LED lamp and method for the manufacture thereof.

Claims:

- (1) An LED lamp comprising
- a resin package (1),
 - a pair of external leads (3) fitted in cavities 2 provided in said resin package (1),
 - an LED chip 4 bonded to one of said paired external leads (3), a lead wire (5) connected between said LED chip (4) and the other external lead (3), and
 - a sealing resin (7) applied onto the light-emitting surface of said resin package (1).

Detailed Description of the Invention:

.....

To the upper end portion of one of the paired external leads 3, there is bonded an LED chip 4 that is composed of a GaP semiconductor and has a size of 0.3 by 0.3 mm squares, and further,

between this LED chip 4 and the upper end portion of the other external lead 3, an Au lead wire 5 is wire-bonded. Further, when a predetermined voltage is applied between both external leads 3, the LED chip 4 emits red light.

For the joining of the LED chip 4 to the external lead 3 and the bonding of the Au lead wire 5, there is used an electrically conductive die bonding paste composed of an epoxy resin containing flaky Ag.

Further, a tapered reflection surface 6 is formed in the circumferential portion of the upper surface of the package 1, so that, when the LED chip 4 emits light, the light thus emitted is reflected upwards. Further, onto the upper surface of this package 1, a sealing resin 7 composed of a double-fluid type transparent epoxy resin is formed by application

As the material of the LED chip, various semiconductors such as GaAs, $\text{GaAs}_{1-x}\text{P}_x$, $\text{Ga}_{1-x}\text{Al}_x\text{As}$, etc. can be used.

Further, as the sealing resin, a single-fluid type epoxy resin, a visible ray transmitting type thermosetting resin or an UV-curing type transparent resin, etc. may be used

(Reference 1)

JP U.M. Appln. Disclosure No. 4-25260 - Feb. 28, 1992

Utility Model Appln. No. 2-65760 - June 21, 1990

Priority: none

Applicant: Sharp K.K., Osaka, Japan

Title: Light-emitting diode element.

Claim:

A light-emitting diode element characterized in that an LED chip die-bonded to an island is positioned in the center of the inner bottom portion of an approximately conical reflector body formed integrally with a lead frame.

Detailed Description of the Innovation:

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Said reflector body 30 is molded into an approximately conical shape by the use of a synthetic resin with a white pigment mixed therein; more specifically, said reflector body 30 is molded integrally with the lead frame in such a manner that the tip ends of said island 11 and said lead pin 13 are exposed on the inner bottom portion 31 of said reflector 30

(In Fig. 1)

100 .. Fig. 1, 10 .. Lead frame, 11 .. Island, 12 ..
Lead pin, 13 .. Lead pin, 20 .. LED chip, 21 .. Bonding
wire, 30 .. Reflector body, 31 .. Inner bottom portion of
the reflector body 30, 32 .. Inner surface of the reflector
body 30.

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 - an LED chip 4 bonded to one of said paired external leads (3), a lead wire (5) connected between said LED chip (4) and the other external lead (3), and
 - a sealing resin (7) applied onto the light-emitting surface of said resin package (1).

Detailed Description of the Invention:

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To the upper end portion of one of the paired external leads 3, there is bonded an LED chip 4 that is composed of a GaP semiconductor and has a size of 0.3 by 0.3 mm squares, and further,

between this LED chip 4 and the upper end portion of the other external lead 3, an Au lead wire 5 is wire-bonded. Further, when a predetermined voltage is applied between both external leads 3, the LED chip 4 emits red light.

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